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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/580,972

02/21/2007

Martin Behringer

5367241PUS

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10/08/2008

COHEN, PONTANI, LIEBERMAN & PAVANE LLP
551 FIFTH AVENUE
SUITE 1210
NEW YORK, NY 10176

EXAMINER

VAN ROY, TOD THOMAS

ART UNIT

PAPER NUMBER

2828

MAIL DATE

DELIVERY MODE

10/08/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/580,972	Applicant(s) BEHRINGER ET AL.	
	Examiner TOD T. VAN ROY	Art Unit 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 July 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>06/26/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Examiner acknowledges the amending of claims 1 and 14, and the cancellation of claim 2.

Response to Arguments

Applicant's arguments filed 07/03/2008 have been fully considered but they are not persuasive.

The Applicant has argued that the previous rejection of claim 2 is non-obvious since Rice is directed to keeping the system below a maximum temperature.

The Examiner does not agree. The previous rejection to claim 2 is based on the fact that each optoelectronic device being made of different materials can be said to have a different thermal time constant. Although Rice does not specify the relationship between his material's time constant and the pulse duration to be $T > .5 \cdot D$, it would be obvious to choose a material for which this holds true in order to take advantage of the fact that the different material type would allow for a different output wavelength regime.

The Examiner further notes that the "thermal time constant", T , has not been defined in the claims. The majority of the Applicant's arguments are directed towards one possible definition of T , and how it relates to the Rice document. As an example, T could be interpreted broadly as the amount of time which the laser device has a temperature above a non-pulsing state (i.e. no applied current). In this manner, the thermal time constant would read on the relationship $T > .5 \cdot D$, and also $T > D$, as the device would necessarily be at a higher temperature just after the pulsing stops. With

this in mind, the Examiner suggests clearly defining the thermal time constant in the claim language.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, 3-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rice (US 6724792).

With respect to claims 1 and 3, Rice teaches a device comprising: a heat sink (fig.2 #30), and a radiation emitting optoelectronic component (fig.2 #19) which is connected to said heat sink and is intended for pulsed operation with a pulse duration D (col.1 lines 61-65), wherein said heat sink is arranged such that temperature changes of the optoelectronic component take place with a thermal time constant T during pulsed

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operation, and wherein the thermal time constant T is matched to the pulse duration D (inherent that the optoelectronic device would have a thermal time constant, and that the time constant T would be a function of D , as D is the period of operation when the laser would necessarily be heated) in order to reduce the amplitude of the temperature changes (purpose of the heat sink). Rice does not detail the thermal time constant to pulse duration relationship. It would have been obvious to one of ordinary skill in the art at the time of the invention to choose a material type of the optoelectronic device such that these relationships hold true in order to use materials of varying frequency output regimes (see arguments above).

With respect to claim 4, Rice teaches the device to cool the temperature of the diodes, but not a specific temperature variable range. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the device of Rice to choose a specific temperature range of device operation as a matter of optimization of a known method (see MPEP 2144.05 II A, “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” *In re Aller*, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

With respect to claim 5, Rice teaches a pulse operation range of 100-1000Hz, but not 0.1-10Hz. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the device of Rice to choose a specific repetition rate of device operation as a matter of optimization of a known method (see MPEP 2144.05 II A, “[W]here the general conditions of a claim are disclosed in the prior art, it is not

inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

With respect to claim 6, Rice discloses the optoelectronic device has an output power of 20W or more (col.5 line 64).

With respect to claim 7, Rice discloses the heat sink is actively cooled (fig.3 coolant).

With respect to claim 8, Rice discloses that the heat sink has one or more microchannels through which coolant flows (fig.2 #32).

With respect to claims 9-10, Rice teaches the device outlined in the rejection to claim 8, including the importance of choosing the proper wall thickness (col.11 lines 49-55), but not specific wall thickness values. It would have been obvious to one of ordinary skill in the art at the time of the invention to adapt the device of Rice to choose a specific wall thickness as a matter of optimization of a known method (see MPEP 2144.05 II A, “[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.” In re Aller, 220 F.2d 454, 456, 105 USPQ 233, 235 (CCPA 1955)).

With respect to claim 11, Rice discloses the heat sink contains copper (col.6 line 50).

With respect to claim 12, Rice discloses the optoelectronic component is a laser diode bar (col.6 lines 17-22).

With respect to claim 13, Rice discloses the method of producing the device outlined in the rejection to claim 8 above, wherein it is inherent that the thickness of the

heat sink influences the temperature of the optoelectronic device (as it can draw heat further from the source via the high heat conductance).

With respect to claim 14, Rice discloses the method of producing the device outlined in the rejection to claim 1 above, wherein the pulse time D and the thermal time constant of the optoelectronic device are inherently matched, and the heat sink ensures reduction of the amplitude of temperature change.

With respect to claim 15, Rice discloses the method outlined above, wherein it is inherent that the thermal time constant is set in part by dimensioning the area or thickness of the substrate as the material choice and dimensions determine the heat conductive and dissipative properties of the device.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TOD T. VAN ROY whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/TVR/

/Minsun Harvey/
Supervisory Patent Examiner, Art Unit 2828